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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Kazmer et al.  
Serial No. : 09/578,108  
Filed : May 24, 2000  
Title : PERFORMANCE-BASED REPRESENTATION FOR SUPPORT OF MULTIPLE DECISIONS

Art Unit : 2762  
Examiner : Unknown

Attention: Official Draftsman  
Commissioner for Patents  
Washington, D.C. 20231

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TRANSMITTAL OF FORMAL DRAWINGS


Please substitute the enclosed 15 sheets of formal drawings for the corresponding drawings presently in the application.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Date: April 11, 2001

  
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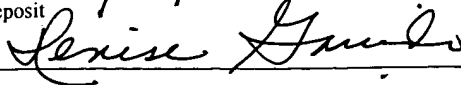
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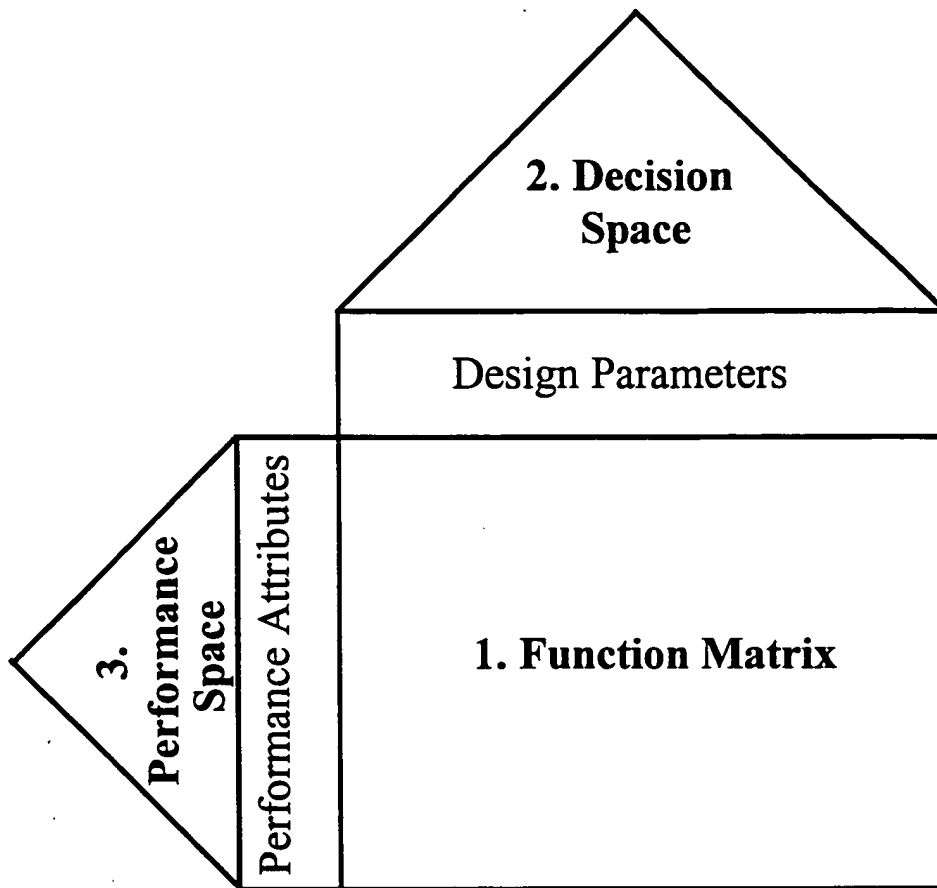
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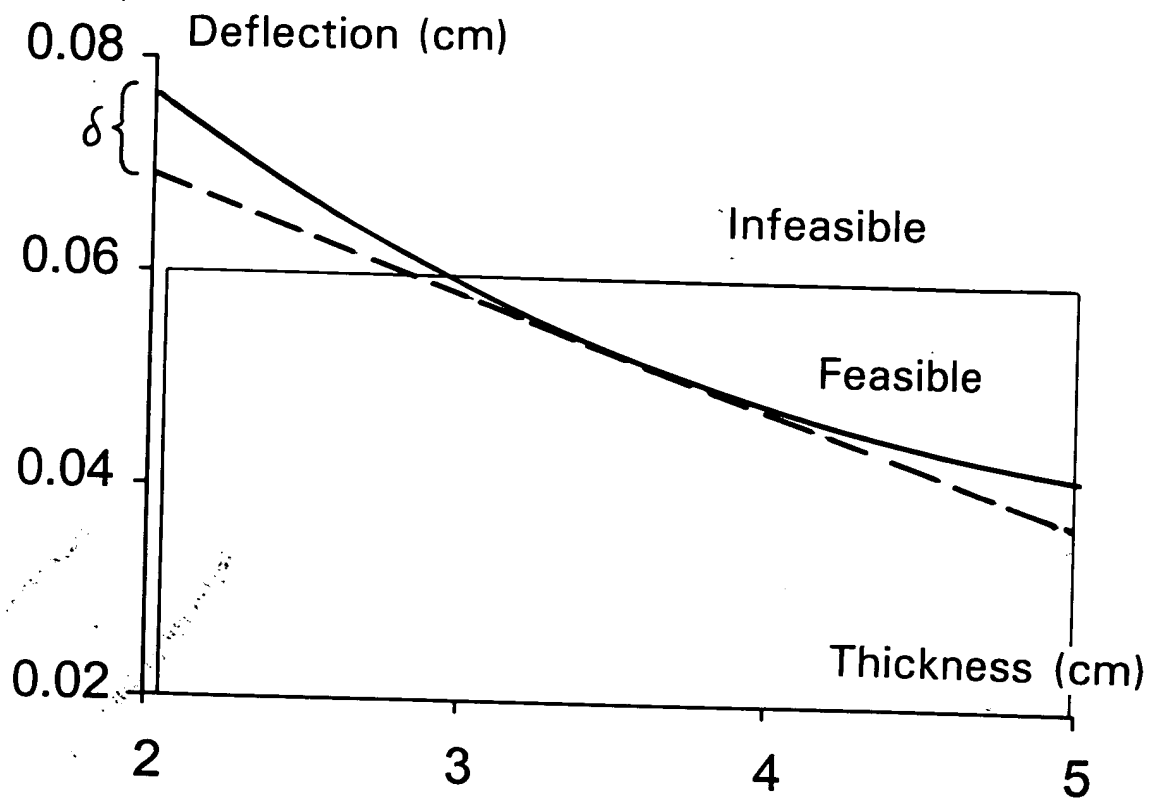
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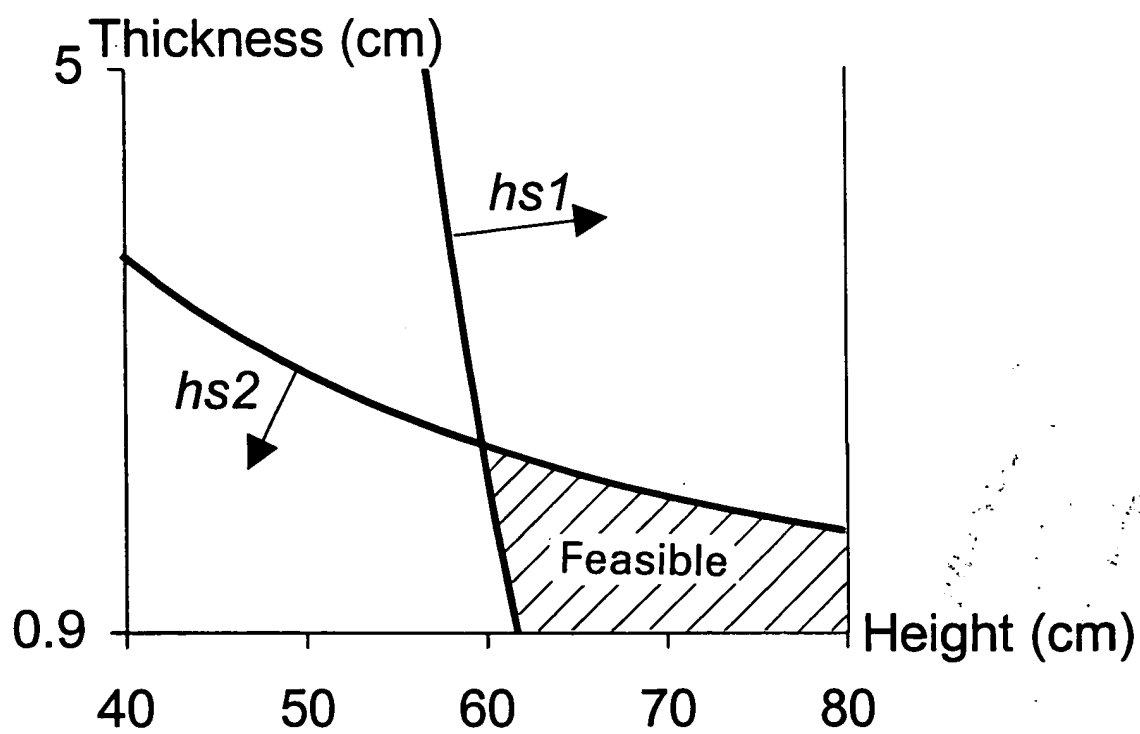
DENISE GARRIDO



**FIG. 1**



**FIG. 2**



**FIG. 3**

1. Initialize the loop

```
lp1 = {  
    (LCLi, LCLj), (LCLi, UCLj),  
    (UCLi, UCLj), (UCLi, LCLj), (LCLi, LCLj)  
},  
k = 1.
```

2. Create the half space  $hs$  defined by the specification  $k$ :  
 $hs = \{X \in R^n \mid f_k(X) \geq LSL_k\}.$

For two-side specifications, repeat Step 3~5 for  $USL_k$ .

3. Set  $lp0 = lp1$ ,  
 $v_a = v_1$ , and  
 $v_b = v_2$ .

Empty  $lp1$ ;

4. If both  $v_a$  and  $v_b$  are inside  $hs$  then  
    add  $v_b$  into  $lp1$ ;  
    else  
        if one of  $v_a$  and  $v_b$  is inside  $hs$  then  
            calculate the intersection point  $v_c$  of  $v_a v_b$  and  $hs$   
            add  $v_c$  into the new loop  $lp1$

    if  $v_b$  is inside  $hs$  then  
        add  $v_b$  into  $lp1$ .

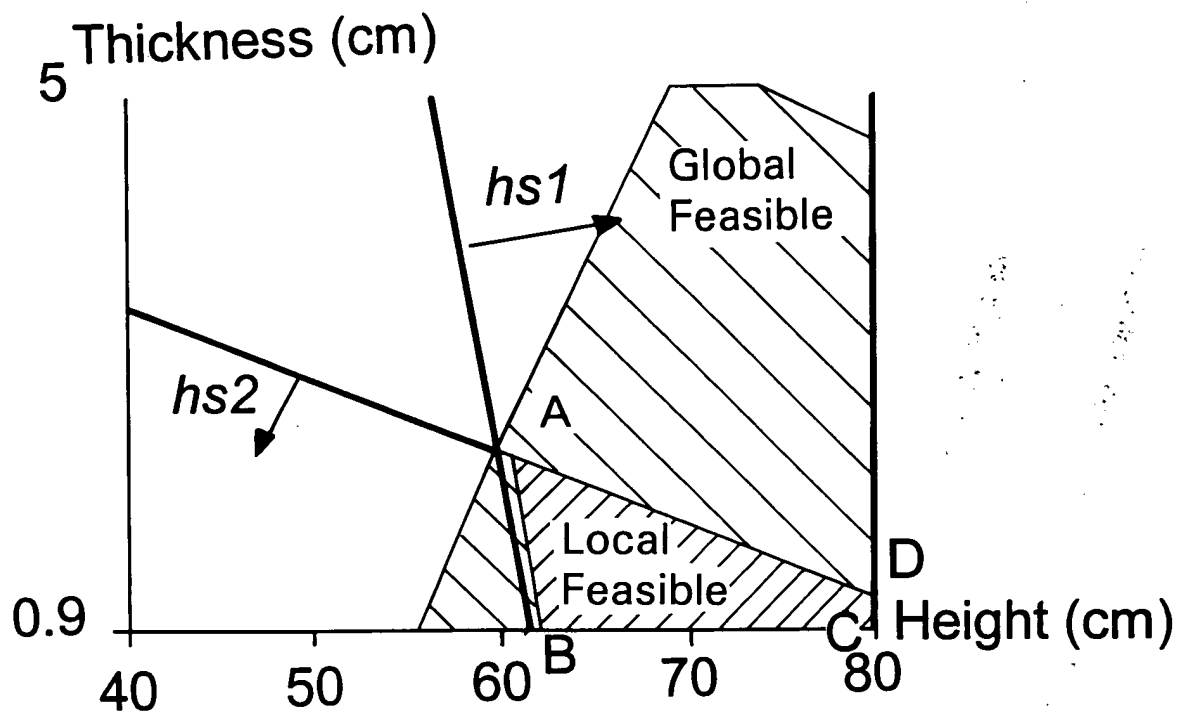
5. Set  $v_a = v_{a+1}$  and  
 $v_b = v_{b+1}$ .

If not all vertices are done, go to step 4.

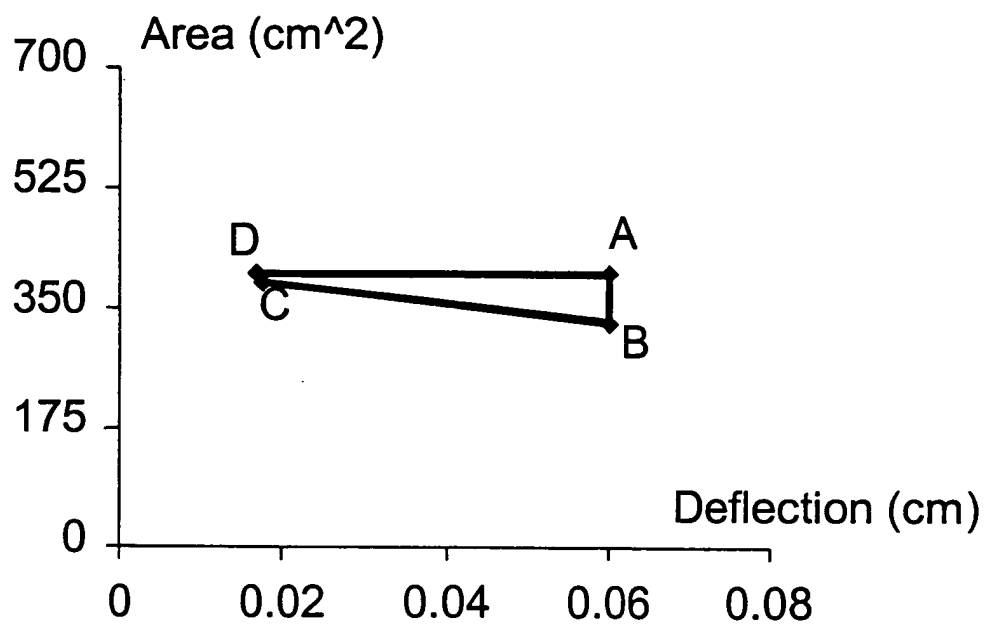
6.  $k = k + 1$ . If  $k \leq n$ , go to step 2.

7. Add the first vertex into the end of  $lp1$  to finish the loop. The region surrounded by  $lp1$  is the feasible space of  $x_i$  vs.  $x_j$  with other parameters fixed.

**FIG. 4**



**FIG. 5**

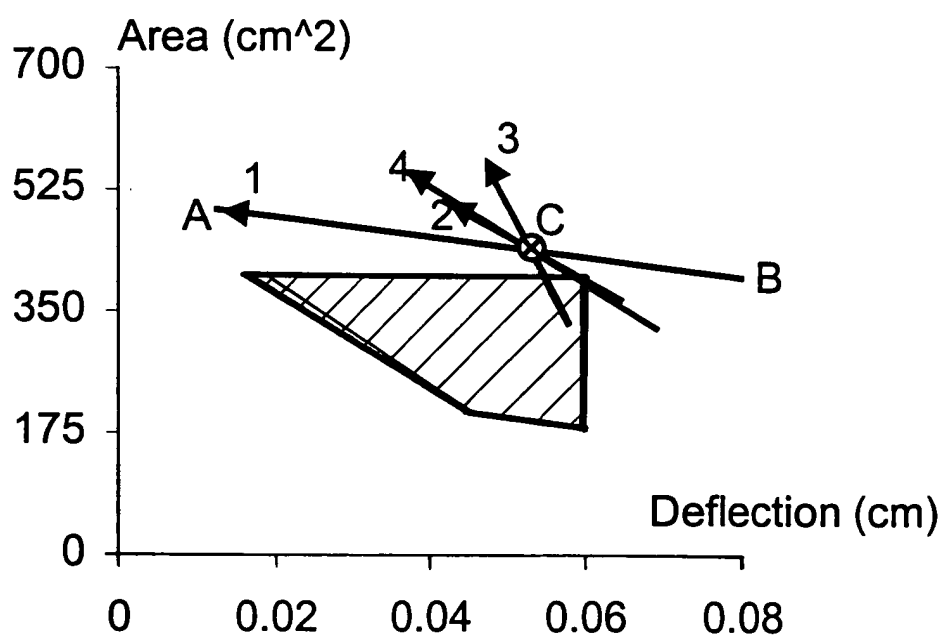


**FIG. 6**

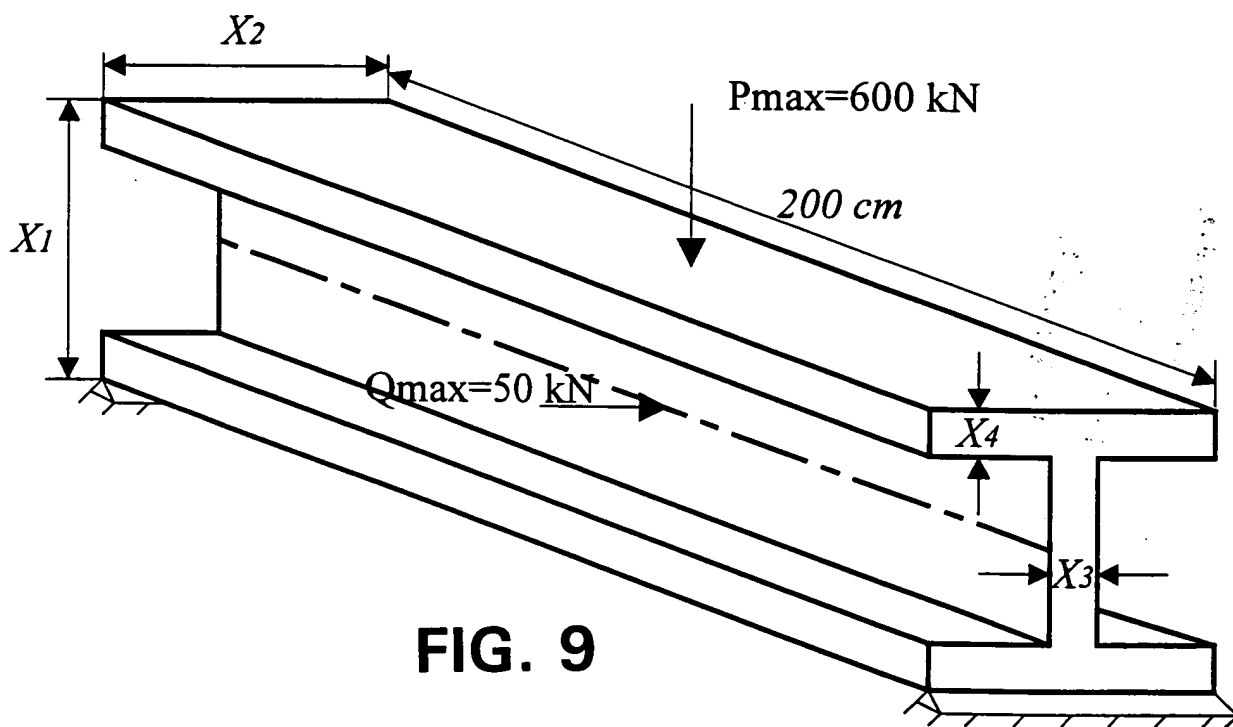
1. Choose  $n$  distinctive constraints from all  $m$  specifications and  $n$  parameter limits;
2. LU decompose  $F$  into  $L \cdot U$ ;
3. Constitute one distinctive right-side  $Y$  from specifications and parameter limits.
4. Solve  $L \cdot U \cdot X = Y$  by forward and back substitution. If the solution  $X^*$  satisfies all the specifications, add it into the extreme point list.
5. If all distinct  $Y$ s have been operated upon, go to next step. Otherwise go to step 3.
6. If all distinct constraint combinations have been operated upon, go to next step. Otherwise go to step 1.
7. All extreme points and the facets are now available. The feasible decision space and performance space can be acquired by projecting the facets into each 2-dimensional viewing pane, though other projections and representations may be beneficial.
8. The boundary of the feasible space in each viewing pane is a convex hull of the extreme points. Graham-scan algorithm can be adopted to retrieve the convex boundary in  $O(h \lg(h))$  time where  $h$  is the number of all vertices.

**FIG. 7**





**FIG. 8**



**FIG. 9**

FIG. 10

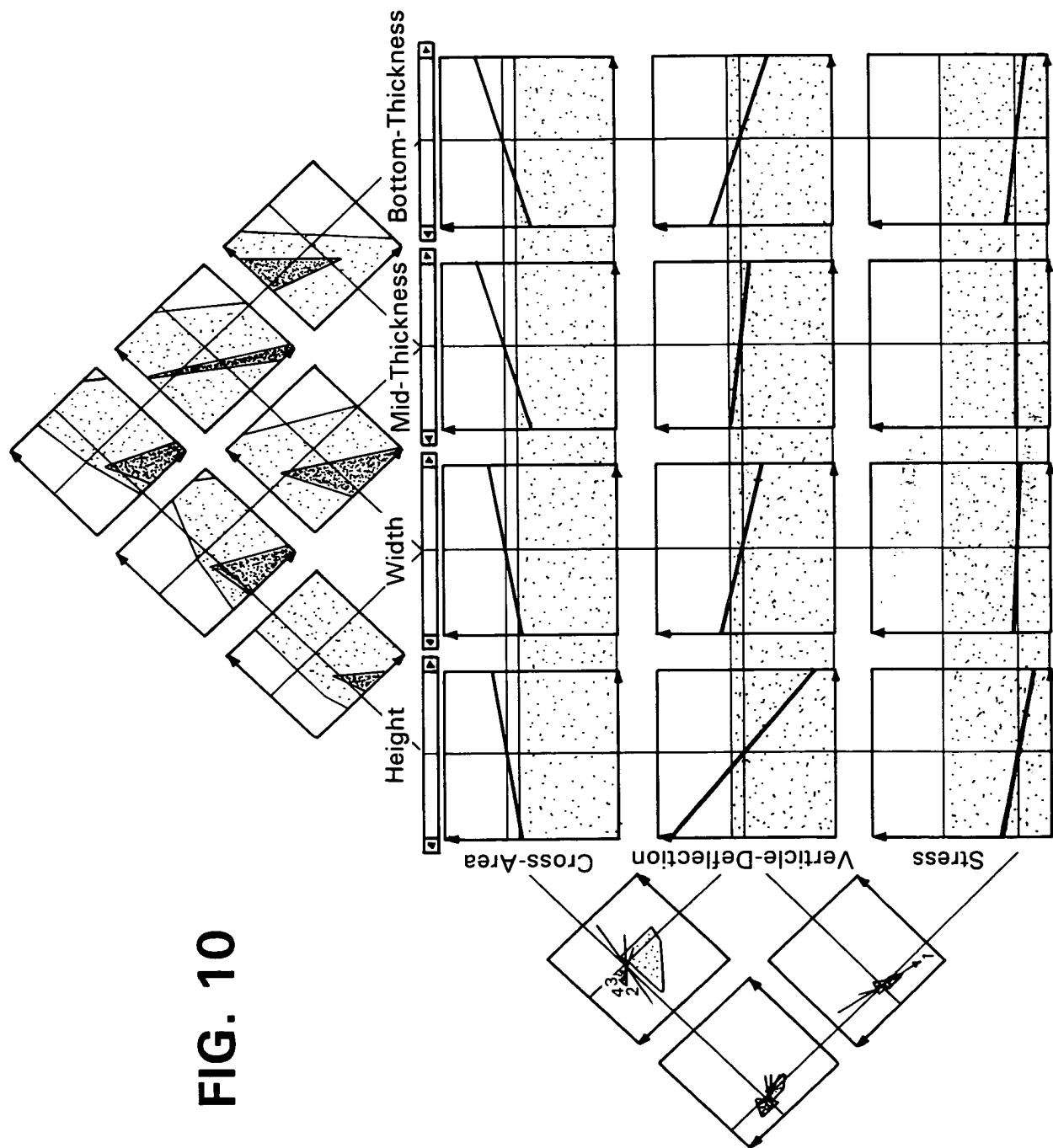
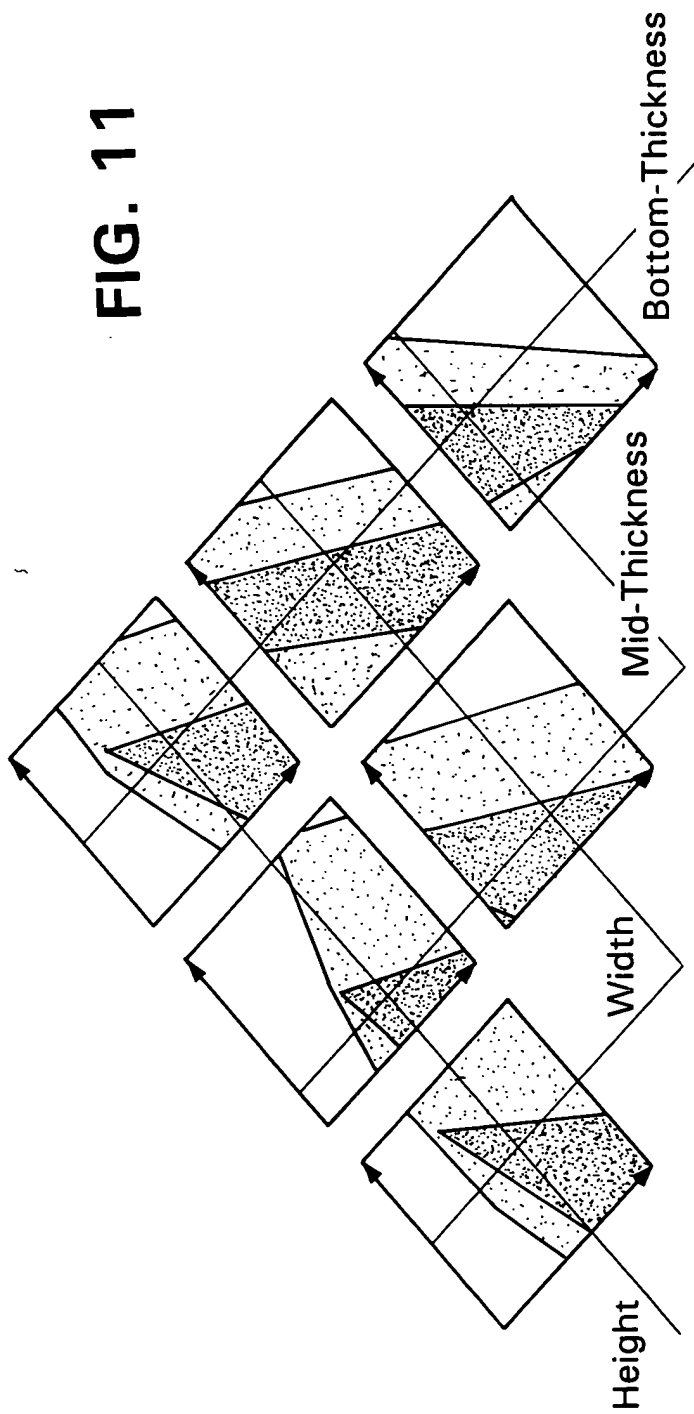
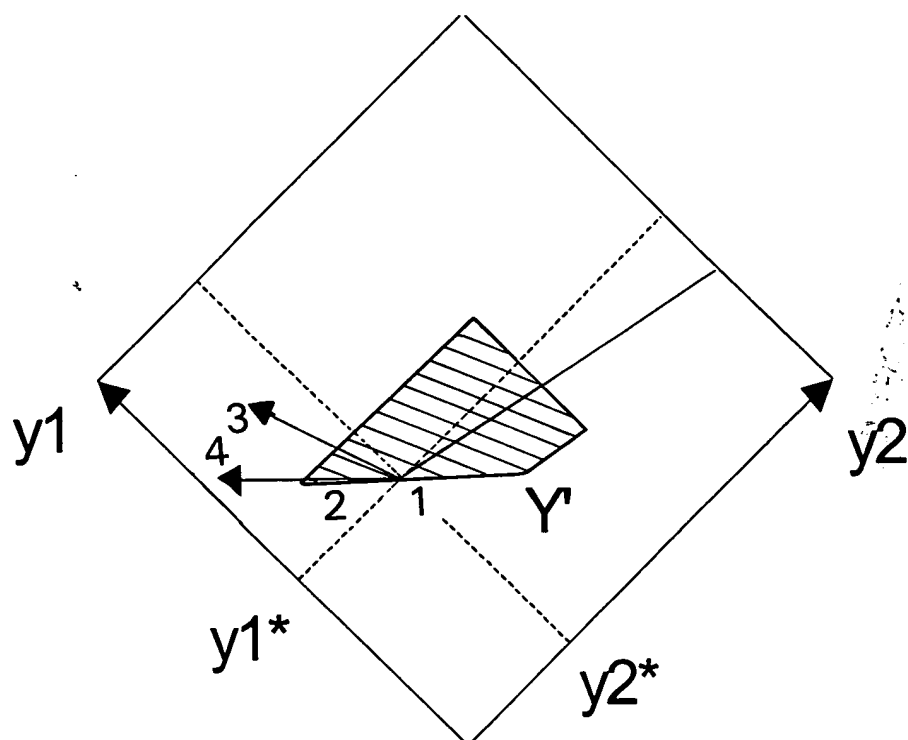


FIG. 11





**FIG. 12**

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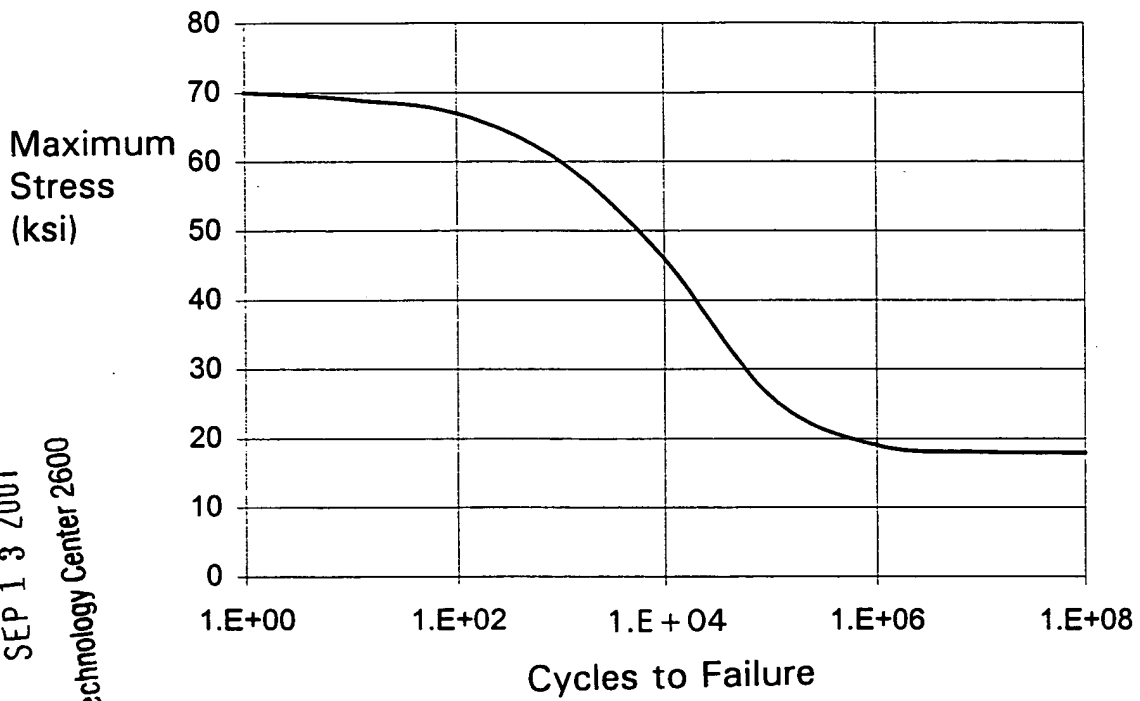
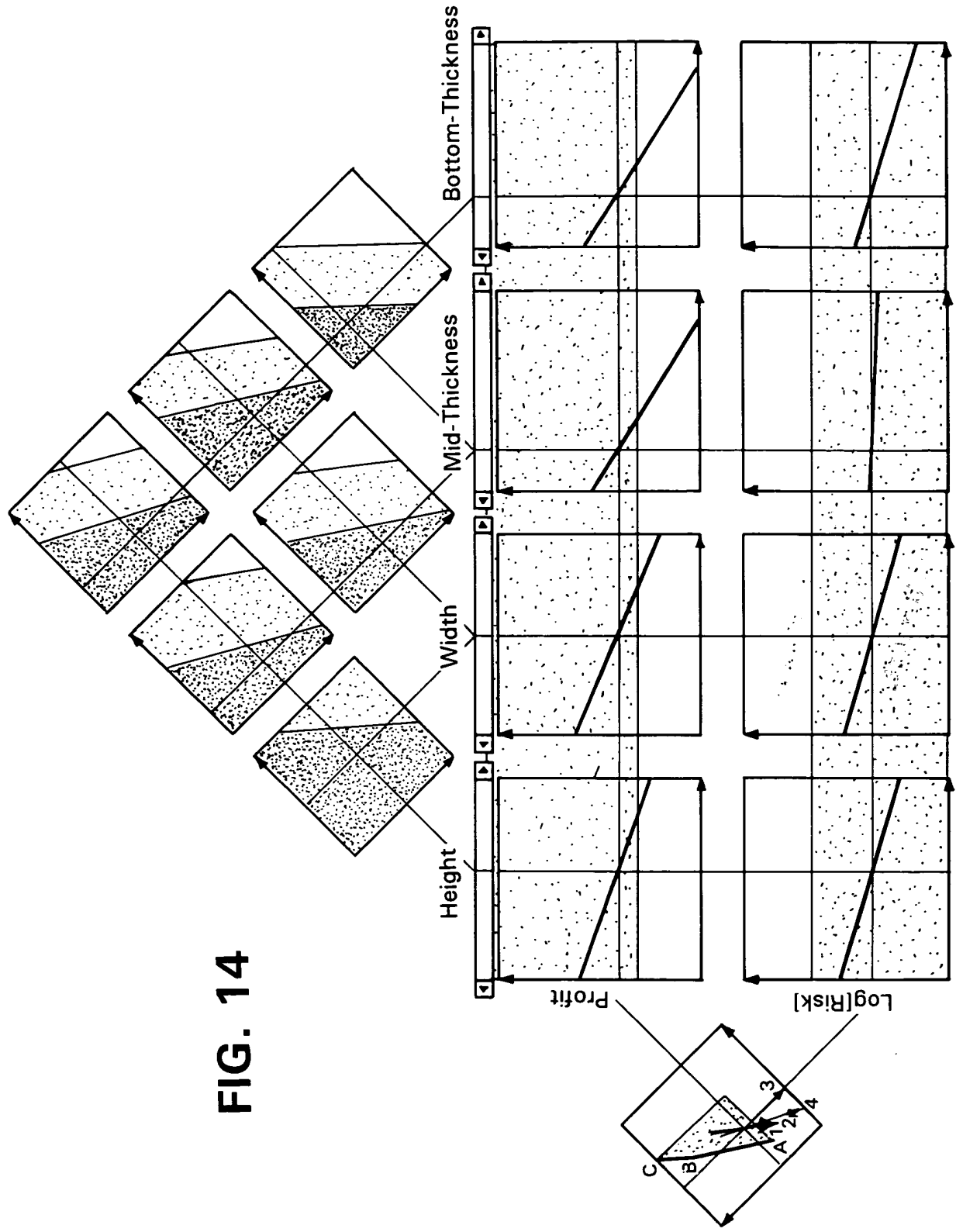
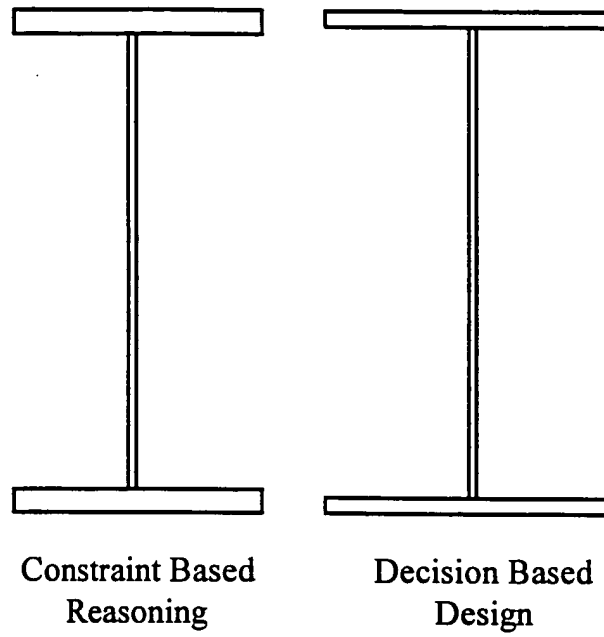


FIG. 13

FIG. 14





**FIG. 15**